

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**

THIS PAGE BLANK (USPTO)



Consommation et
Affaires commerciales Canada

Consumer and
Corporate Affairs Canada

Bureau des brevets

Patent Office

Ottawa, Canada
K1A 0C9

(21) (A1)	2,081,439
(22)	1992/10/26
(43)	1994/04/27

5,077,7/21

(51) INTL.CL. ⁵ A63B-059/14; B32B-005/08

(19) (CA) **APPLICATION FOR CANADIAN PATENT** (12)

(54) **Handle Component for a Hockey Stick and a Method of
Manufacture Thereof**

(72) Drolet, Denis - Canada ;

(73) Inglasco Corporation Ltd. - Canada ;

(57) 21 Claims

Notice: This application is as filed and may therefore contain an
incomplete specification.

Canada

CCA 3254 (10-82) 41 7530-21-935-3254

ABSTRACT OF THE DISCLOSURE

A handle component for a hockey stick, comprising a core of soft wooden material having a pair of opposite lateral faces to which are applied in a superposed relationship first and second reinforcing layers of synthetic fibrous material. The first reinforcing layer includes fibers united in yarn-like bundles which cross each other and form a woven network. The second reinforcing layer is constituted by unidirectional fibers extending along the longitudinal axis of the wooden core. A binder medium bonds the reinforcing layers to the wooden core to form a structurally integral assembly. The invention also extends to a method for manufacturing the handle component.

2081429

**TITLE: HANDLE COMPONENT FOR A HOCKEY STICK AND A METHOD
OF MANUFACTURE THEREOF**

FIELD OF THE INVENTION

5

The present invention relates to the art of manufacturing sporting implements, more particularly, to a handle component for a hockey stick reinforced with layers of synthetic fibers having different network configurations to impart increased resistance to the handle component. The invention also extends to a method for manufacturing the handle component.

10

BACKGROUND OF THE INVENTION

15

In order to reinforce the handle of a hockey stick, the prior art teaches to apply on the lateral surfaces of the handle which are parallel to the plane of the blade, relatively thin layers of synthetic fibers, such as glass fibers, which extend longitudinally on the handle. The fibers are embedded in a suitable matrix such as synthetic resin forming a bonding medium to intimately retain the fibers to the handle component.

20

2081429

By virtue of the high tensile strength of the synthetic fibers the resistance of the handle component to bending stresses is increased. Such bending stresses are developed in response to curvature induced by an external load, such as when the player severely strikes the puck with the blade of the hockey stick.

It is believed, however, that further improvement to the resistance of the handle of the hockey stick can be achieved by combining together a plurality of reinforcing layers having different fiber network configurations.

OBJECTS AND STATEMENT OF THE INVENTION

An object of the present invention is a novel handle component for a hockey stick which is highly resistant to bending efforts.

Another object of the invention is a method for manufacturing the aforementioned handle component.

A further object of the present invention is to provide a hockey stick utilizing the aforementioned handle component.

25

As embodied and broadly described herein the invention provides a handle component for a hockey stick, comprising:

5 - a core of wooden material having a pair of generally opposite main faces extending along a longitudinal axis of the core;

10 - first and second reinforcing layers of synthetic fibrous material applied against each main face of the core in a superposed relationship, the first reinforcing layer including crossing fibers extending in different directions, the second reinforcing layer including generally parallel fibers extending along the longitudinal axis; and

15 - a matrix binding the reinforcing layers to the core to form a structurally integral assembly.

20 In a most preferred embodiment, the first reinforcing layer comprises glass fibers united in yarn-like bundles extending transversely and longitudinally relative to the wooden core. The yarn-like bundles are arranged in a woven network, in other words, the yarn-like bundles interlace each other in the manner of a textile fabric.

25 It has been found that the combination of reinforcing layers using bidirectional and unidirectional fiber configurations, donates to the handle component a significantly higher resistance to bending stresses.

2081429

As embodied and broadly described herein, the invention also provides a method for manufacturing a handle component for a hockey stick, comprising the following steps:

- 5 - providing a core of wooden material having a pair of generally opposite main faces extending along a longitudinal axis of the core;
- 10 - applying on each main surface of the core first and second reinforcing layers of synthetic fibrous material in a superposed relationship, the first reinforcing layer including crossing fibers extending in different directions, the second reinforcing layer including generally parallel fibers extending along the longitudinal axis; and
- 15 - bonding the reinforcing layers to the core to form a structurally integral assembly.

20 Most preferably, the various layers of the handle component are deposited in a superposed relationship in a curing mould having a suitable shape and uncured binder is applied between the various layers of the assembly. The mould is then closed to create a mechanical pressure on the laminated structure and the temperature of the mould is elevated to cure the binder.

BRIEF DESCRIPTION OF THE DRAWINGS:

- Figure 1 is a perspective view of a hockey stick constructed in accordance with the present invention;

5

- Figure 2 is a highly enlarged cross-sectional view taken along lines 2-2 in Figure 1; and

- Figure 3 is an exploded view of the handle component of the hockey stick shown in Figure 1.

10

DESCRIPTION OF A PREFERRED EMBODIMENT

With reference to the annexed drawings, the present invention provides a hockey stick designated comprehensively by the reference numeral 10, comprising an elongated handle component 12 to which is mounted a blade 14.

15

The object of the present invention is an improved handle component 12 of the hockey stick whose structure is best shown in Figures 2 and 3. More particularly, the handle component 12 comprises a core of soft wooden material 16 which extends longitudinally throughout the entire length of the handle 12. The wooden core 16 is preferably an assembly of smaller wooden components glued to one another to form a larger unit, or alternatively it

20

25

may be a unitary piece of wood. On the lateral main surfaces of the wooden component 16 are applied veneers 18 of hard wood.

5 On the outside surface of each veneer 18 is positioned a first reinforcing layer 20 constituted by fine glass fibers united in yarn-like bundles which are weaved to form a textile-like fabric structure. More specifically, the yarn-like bundles cross and interlace
10 each other, extending transversely and longitudinally relative to the wooden core 16.

 On each reinforcing layer 20 is mounted a second reinforcing layer 22 in the form of a board comprising
15 parallel, longitudinally extending glass fibers in binder matrix.

 The method for manufacturing the handle component 12 consists of placing in a superposed relationship the
20 various components of the handle in a shaping mould and applying between the layers a suitable bonding agent such as synthetic resin which when cured acts as a strong adhesive to maintain these layers intimately associated to one another. The shaping mould is then closed to create
25 a mechanical pressure on the assembly and the temperature in the mould cavity is elevated to cure the bonding medium.

5 The mould is then opened and the handle component is then transferred to further processing stations for attaching the blade 14 to its lower end, polishing, cleaning, applying various markings, etc.

10 Most preferably, the layers 22 are selected to be translucent allowing the reinforcing layers 20 to be visible. This feature enhances the aesthetical appearance of the handle by allowing the network structure of the reinforcing layers 20 to show.

15 The above description of a preferred embodiment of this invention should not be interpreted in any limiting manner as it may be refined and varied in several ways without departing from the spirit of the invention. The scope of the invention is defined in the annexed claims and their equivalents.

1. A handle component for a hockey stick, comprising:
 - a core of wooden material having a pair of generally opposite main faces extending along a longitudinal axis of said core;
 - first and second reinforcing layers of synthetic fibrous material applied against each main face of said core in a superposed relationship, said first reinforcing layer including crossing fibers extending in different directions, said second reinforcing layer including generally parallel fibers extending along said longitudinal axis; and
 - a matrix bonding said reinforcing layers to said core to form a structurally integral assembly.
2. A handle component as defined in claim 1, wherein said first reinforcing layer is positioned between said second reinforcing layer and said core.
3. A handle component as defined in claim 1, wherein said first reinforcing layer includes synthetic fibers united in yarn-like bundles.
4. A handle component as defined in claim 3, wherein said yarn-like bundles form a woven network.
5. A handle component as defined in claim 1, wherein said first reinforcing layer includes fibers which extend transversally and longitudinally relative to said core.

6. A handle component as defined in claim 1, wherein said core is made of a relatively soft wooden material.
7. A handle component as defined in claim 1, further comprising a layer of wooden material substantially harder than a wooden material of said core applied to a each main face of said core.
8. A handle component as defined in claim 7, wherein said layer wooden material is positioned between said core and said reinforcing layers.
9. A handle component as defined in claim 2, wherein said second reinforcing layer is light transmissive.
10. A hockey stick comprising the handle component defined in claim 1.
11. A method for manufacturing a handle component for a hockey stick, comprising the following steps:
 - providing a core of wooden material having a pair of generally opposite main faces extending along a longitudinal axis of said core;
 - applying on each main surface of said core first and second reinforcing layers of synthetic fibrous material in a superposed relationship, said first reinforcing layer including crossing fibers extending in different directions, said second reinforcing layer

including generally parallel fibers extending along said longitudinal axis; and

- bonding said reinforcing layers to said core to form a structurally integral assembly.

12. A method for manufacturing a handle component for a hockey stick as defined in claim 11, comprising the step of applying said first reinforcing layer between said core and said second reinforcing layer.

13. A method for manufacturing a handle component as defined in claim 11, wherein said first reinforcing layer includes synthetic fibers united in yarn-like bundles.

14. A method for manufacturing a handle component as defined in claim 11, wherein said first reinforcing layer includes synthetic fibers united in yarn-like bundles.

15. A method for manufacturing a handle component as defined in claim 14, wherein said yarn-like bundles form a woven network.

16. A method for manufacturing a handle component as defined in claim 11, wherein said first reinforcing layer includes fibers which extend transversally and longitudinally relative to said core.

17. A method for manufacturing a handle component as defined in claim 11, wherein said core is made of a relatively soft wooden material.
18. A method for manufacturing a handle component as defined in claim 11, comprising the step of applying to each main surface of said core a layer of wooden material substantially harder than a wooden material of said core.
19. A method for manufacturing a handle component as defined in claim 18, wherein said layer wooden material is positioned between said core and said reinforcing layers.
20. A method for manufacturing a handle component as defined in claim 11, comprising the step of applying on each main surface of said core a board of unidirectional synthetic fibers, which forms said second reinforcing layer.
21. A method for manufacturing a handle component as defined in claim 20, further comprising the step of applying uncured binder substance to said board, to said first reinforcing layer and to said core, and subjecting said board, said first reinforcing layer and said core to pressure and to elevated temperature to cure said binder substance.

2081429

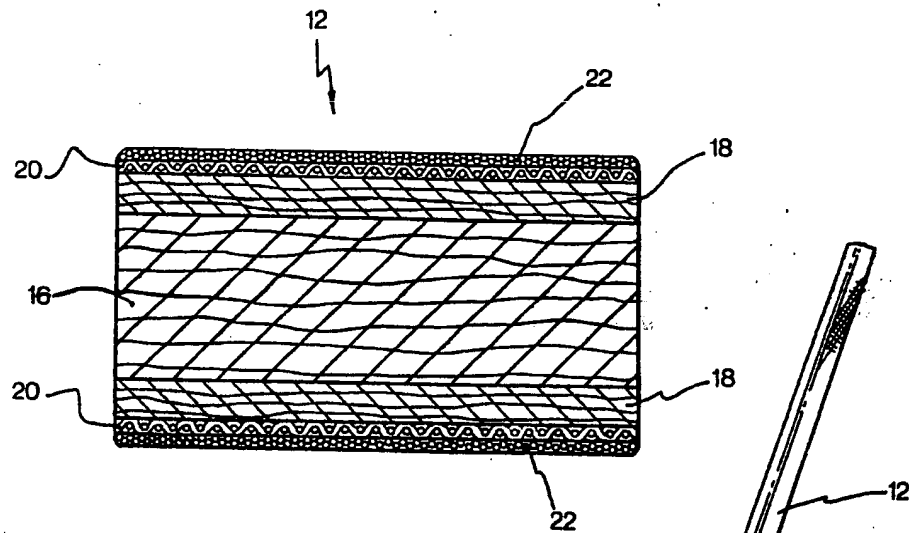


FIG. 2

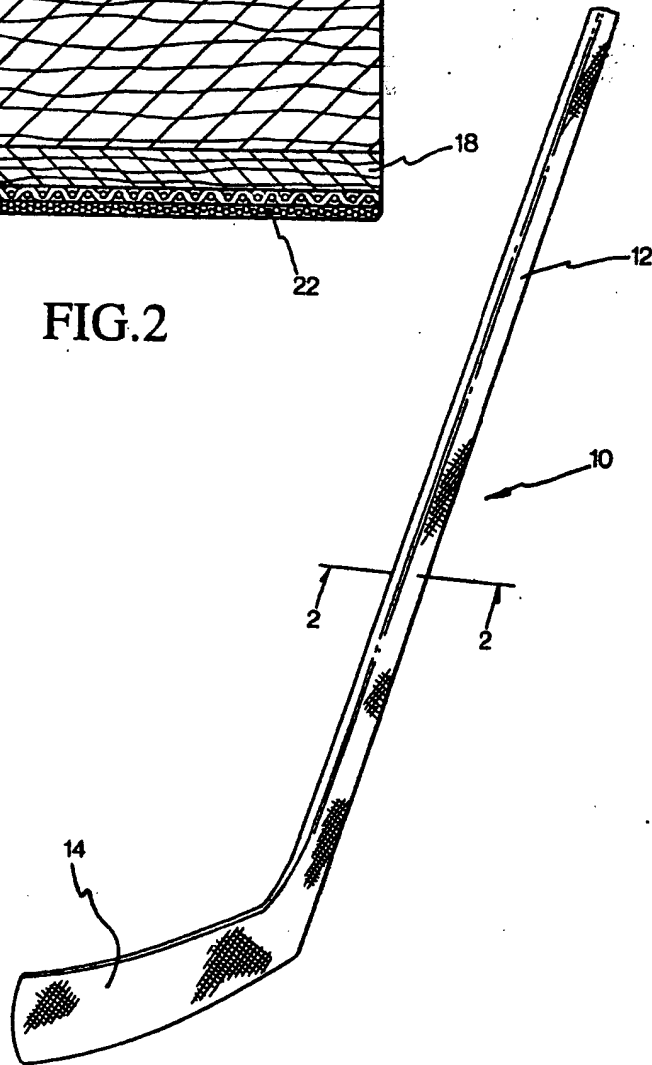


FIG. 1

2081429

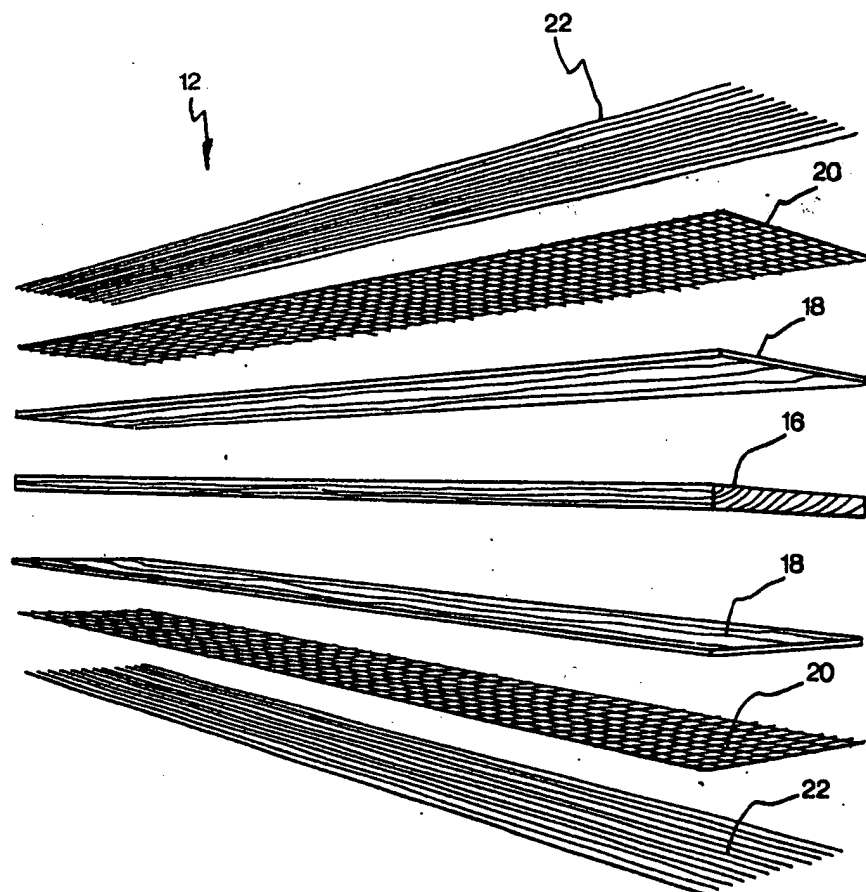


FIG.3

